DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

			Design Fuel and URGE load	
1.	**PERFORMANCE GUARANTEES (Performance Data & Calculations Shall Conform to Section 441130)**	**Units**	**Unit 1**	**Unit 2**
1.1	Sulfur Dioxide (SO_2)	---		
a.	SO2 Removal Efficiency	%		
b.	SO2 Outlet Concetration	lb/mmBtu		
c.	Optional SO2 Outlet Emission Rate	lb/mmBtu		
1.2	Particulate Emissions Rate	lb/mmBtu		
1.3	Maximum Entrained Moisture Carryover at Outlet of Mist Eliminator	gr/scf		
1.4	Calcium Sulfite-to-Sulfate Oxidation	%		
1.5	Ball Mill Capacity and Grinding Fineness			
1.6	Noise level @ 1 meter	dBA		
1.7	Flue Gas Pressure drop from Contractor's Inlet Ductwork through Contractor's connection to Chimney Breeching	in. w.g.		
1.8	Maximum Power Consumption of Contractor Equipment	---		
a.	Instantaneous Peak	kW		
b.	24-hr Average	kW		
1.9	Limestone Consumption	---		
a.	Mass Flow	ton/hr		
b.	Stoichiometry	Ca:S Rem.		
1.10	Gypsum Quality, % solids			
1.11	Equivalent Availability Guarantee (12 months)			
1.12	Sulfuric Acid Mist (H_2SO_4)	%		
1.13	Mercury (Hg)	%		
1.14	Hydrochloric Acid (HCl)	%		

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

			Design Fuel and URGE load	
		Units	Unit 1	Unit 2
2.	**Operating Data & Process Parameters**			
2.1	Flue Gas Flow from WFGD module			
a.	Mass Flow Rate	lb/hr		
b.	Volumetric Flow Rate	acfm		
2.2	Flue Gas Temperature from WFGD Module	^{o}F		
2.3	Maximum SO_2 Emissions			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	lb/mmBtu		
c.	Concentration	ppmvd @ 3%O_2		
d..	Removal Efficiency	%		
2.4	Maximum Particulate Emissions			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	lb/mmBtu		
2.5	Maximum Sulfuric Acid Mist Emissions			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	ppmw		
2.5	Maximum Hydrochloric Acid Emissions			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	ppmw		
2.6	Maximum Mercury Emissions			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	lb/TBtu		
2.7	Entrained Moisture Carryover			
a.	Mass Flow Rate	lb/hr		
b.	Concentration	gpm/ft^2		
2.8	Flue Gas Velocity Through Absorber at saturated gas conditions	ft/s		
a.	Through spray section	ft/s		
2.9	Gas-Side Pressure Drop	in. w.g.		
a.	Absorber Liquid to Gas Ratio (≥75)	gal/ACF_{sat}		
2.10	Forced Oxidation Air	scfm		
a.	Oxidation Air Stoichioimetry	mol O/mol SO_2		
2.11	Limestone Consumption @ Design Inlet SO_2	ton/hr		
2.12	Solids Content of Hydroclone Underflow	%		
2.13	Solids Composition of Hydroclone Underflow			
a.	Calcium Sulfite	dry %		
b.	Calcium Sulfate	dry %		
c.	Unused reagent & Inerts	dry %		
d..	Solids Content of drum filter cake	%		
e.	Discharge of dewatered gypsum product from the dewatering system			
2.14	Calcium Sulfite-to-Sulfate Oxidation	%		
2.15	Instantaneous Peak Power Consumption			
a.	Absorber Area	kW		
b.	Limestone Preparation	kW		
c.	Dewatering	kW		
2.16	Instantaneous Peak Water Consumption			
a.	Absorber Area	gpm		

b.	Limestone Preparation	gpm		
c.	Dewatering	gpm		
2.17	Station Air Requirements			
a.	Instantaneous Peak Demand	cfm		
b.	Minimum Pressure	psig		
2.18	Instrument Air Requirements			
a.	Instantaneous Peak Demand	cfm		
b.	Minimum Pressure	psig		

DATA PAGES FOR
WFGD SYSTEMS
NAME OF CONTRACTOR: _____

	Equipment Data	Units	Unit 1	Unit 2
3.	**ABSORBER**			
3.1	Type			
3.2	Dimensions	ft x ft		
3.3	Cross-sectional Area	ft^2		
3.4	Height	ft		
3.5	Quantity of Recycle Stages (Operating/Spare)			
a.	Number of Spray Stages			
b.	Number of Tray Stages			
3.6.	Shell Material & Thickness			
a.	Wet/Dry Interface (Quench Area)			
b.	reagent Tank	base material / in.		
c.	Retention Tank Floor	base material / in.		
d.	Section	base material / in.		
e.	Cone	base material / in.		
f.	Spray Area	base material / in.		
g.	Mist Eliminator	base material / in.		
h.	Outlet Elbow	base material / in.		
i.	External Stiffiners	base material / in.		
3.7	Internal Piping Material			
a.	Recycle Spray Piping			
b.	Recycle Spray Nozzles			
c.	Mist Eliminator Wash Piping			
d.	Mist Eliminator Wash Nozzles			
e.	Oxidation Air Piping			
3.8	Pressure Drop			
a.	System Entry & Inlet Losses	in. w.c.		
b.	Absorber Entry	in. w.c.		
c.	Across Internals	in. w.c.		
d.	Across Mist Eliminator	in. w.c.		
e.	Exit Loss	in. w.c.		
f.	System Exit & Outlet Duct to Chimney Breech	in. w.c.		
g.	Total System (All Sprays in Service)	in. w.c.		
3.9	Mist Eliminator			
a.	Type			
b.	Number of Passes			
c.	Material of Construction			
d.	Gas Velocity	ft/s		
e.	Residence Time	s		
f.	Frequency of Washing	min/hr		
g.	Duration of Washing	min		
h.	Nozzle Spray Angle			
3.9	Recycle Spray Nozzles			
a.	Quantity per Module			
b.	Quantity per Spray Level			
c.	Size	in.		
d.	Material			
e.	Spray Angle	o		
f.	Full/Hollow Cones			
g.	Design Pressure	psi		

DATA PAGES FOR
WFGD SYSTEMS
NAME OF CONTRACTOR: _____

Equipment Data	Units	Integral Recycle Tank - Unit 1	Integral Recycle Tank - Unit 2	Mist Eliminator Wash Water Tank - Unit 1
4. TANKS				
4.1 Number of Tanks				
4.2 Dimensions	height ft x diameter ft			
4.3 Shop or Field Fabricated?				
4.4 Solids Content	%			
4.5 Specific Gravity				
4.6 pH				
4.7 Capacity				
a. Operating	gal			
b. Surge/Reserve	gal			
c. Total	gal			
4.8 Maximum Operating Weight	lb			
4.9 Liquid Residence Time	min			
4.10 Solids Residence Time	hr			
4.11 Material of Construction (ASTM spec no.)				
4.12 Shell thickness	in			
4.13 Tank top/ bottom / head thickness	in			
4.14 Corrosion/erosion allowance	in			
4.15 Lining				
a. Material				
b. Thickness	in			

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____ **NAME OF CONTRACTOR:** _____ **NAME OF CONTRACTOR:**

Mist Eliminator Wash Water Tank - Unit 2	Hydroclone Underflow Tank - Unit 1	Hydroclone Underflow Tank - Unit 2	Limestone Slurry Tank	Reclaim Water Tank	Filter Feed Tank	Maintenance Storage Tank

Mill Slurry Tank	Tank (other)

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____ **NAME OF CONTRACTOR:** _____

Equipment Data	Units	Absorber Recycle Tank Agitator - Unit 1	Absorber Recycle Tank Agitator - Unit 2	Hydroclone Underflow Tank Agitator - Unit 1	Hydroclone Underflow Tank Agitator - Unit 2	Mill Slurry Tank Agitator
5. AGITATORS						
5.1 Quantity of Agitators						
5.2 Shaft Size	in					
5.3 Shaft Material						
5.4 Blade Size	in					
5.5 Blade Material						
5.6 Lining Material						
5.7 Lining Thickness	in					
5.8 Calculated BHP at Design Conditions	bhp					
5.9 Type of Drive Gear						

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

Limestone Slurry Tank Agitator	Maintenance Slurry Tank Agitator	Filter Feed Tank Agitator	Agitator (Other)

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

Equipment Data	Units	Absorber Recycle Pumps - Unit 1	Absorber Recycle Pumps - Unit 2	Emergency Quench Water Pumps - Unit 1	Emergency Quench Water Pumps - Unit 2	Absorber Bleed Pumps - Unit 1
6. PUMPS						
6.1 Quantity of Pumps						
6.2 Casing Material						
6.3 Shaft Material						
6.4 Impeller Material						
6.5 Wear rings Material						
6.6 Throat liner Material						
6.7 Other fittings Material						
6.8 Lining material						
6.9 Type of pump						
6.10 Type of mechanical shaft seals						
6.11 Type of drive						
6.12 Speed	rpm					
6.13 Impeller tip speed	ft/s					
6.14 Flow rate at:	gpm					
a. Design						
b. Minimum flow						
c. Runout						
6.15 Total developed head at:						
a. Design	ft					
b. Runout	ft					
c. Shutoff	ft					
6.16 NPSH at:						
a. Design	ft					
b. Runout	ft					
6.17 Calculated bhp required at rated capacity	BHP					
6.18 Efficiency at design capacity and head	%					
6.19 Minimum submergence (sump pumps only)	ft					
6.20 Suction strainers provided	Y/N					
6.21 Bearing cooling water						
a. Quantity required	gpm					
b. Pressure	psig					

Absorber Bleed Pumps - Unit 2

DATA PAGES FOR
WFGD SYSTEMS
NAME OF CONTRACTOR: _____

Mist Eliminator Wash Water Pumps - Unit 1	Mist Eliminator Wash Water Pumps - Unit 2	Hydroclone Underflow Pumps - Unit 1	Hydroclone Underflow Pumps - Unit 2	Flush Water Pumps	Mill Slurry Pumps

DATA PAGES FOR
WFGD SYSTEMS
NAME OF CONTRACTOR: _____

Limestone Slurry Feed Pumps	Maintenance Slurry Storage Pumps	Reclaim Water Pumps	Filter Feed Pumps	Filtrate Feed Pumps	Filter Vacuum Pumps

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR:

Pumps (Other)	Sump Pumps - Absorber Area	Sump Pumps (Other)

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

	Equipment Data	Units	Unit 1	Unit 2
7.	**PIPE DATA (ASTM and Diameter)**			
7.1	Absorber recycle pump suction/external discharge piping			
7.2	Absorber spray headers			
7.3	Absorber blowdown piping to primary dewatering			
7.4	Other Construction Quantities:			
a.	Piping:			
a.1.	2 inch diameter and below	ft		
a.2.	2 1/2 inch diameter and above	ft		
b.	Valves:			
b.1.	2 inch diameter and below	quantity		
b.2.	2 1/2 inch diameter and above	quantity		
8.	**COMPRESSORS AND/OR BLOWERS**			
8.1	Oxidation Air Compressors			
a.	Service			
b.	Type			
c.	Quantity			
d.	Capacity (scfm)	scfm		
e.	Power requirement (BHP)	BHP		
f.	Accessory equipment (e.g.: silencers, etc.)			
g.	Motors			
g.1	Type			
g.2	Manufacturer			
g.3	Frame size			
g.4	Mounting			
g.5	Voltage/voltage variation			
g.6	Phase			
g.7	Sync speed	rpm		
g.8	Rated power	bhp		
g.9	Rated full load speed	rpm		
g.10	Service factor			
g.11	Rotation (from driving end)			
g.12	Ground terminals provided?	Y/N		
g.13	Type of duty			
g.14	Method of starting			
g.15	Maximum winding temp	°F		
g.16	Area Classification:			
g.16.1	Type of service			
g.16.2	Enclosure			
g.16.3	Type of cooling			
g.16.4	Insulation class			
g.17	Locked Rotor Current:			
g.17.1	At 80% voltage			
g.17.2	At 100% voltage			
g.17.3	At 110% voltage			
g.18	Motor Starting Current:			
g.18.1	At 80% voltage			
g.18.2	At 100% voltage			
g.18.3	At 110% voltage			

g.19	Motor Efficiency:			
g.19.1	At 100% load			
g.19.2	At 75% load			
g.19.3	At 50% load			
g.20	Power Factor			
g.20.1	At 100% load			
g.20.2	At 75% load			
g.20.3	At 50% load			
8.2	Instrument / Service Air Compressor			
a.	Type			
b.	Model			
c.	Quantity			
d.	Quantity of air delivered (14.7 psia, 60°F, 0% R.H.)	scfm		
e.	Air delivery pressure	psig		
f.	Air delivery temperature	°F		
g.	Moisture content of air delivered	(lbs H2O/1000 scfm)		
h.	Maximum air delivery temperature to aftercooler	°F		
i.	Inlet air capacity (including sealing air)	icfm		
j.	Cooling Water Requirements:			
j.1	Flow	gpm		
j.2	Temperature rise	°F		
j.3	Pressure drop	psid		
j.4	Water quality requirements			
j.5	Is separate closed cooling system required and provided?			
k.	Main shaft operating speed	rpm		
l.	Efficiency:	%		
l.1	Volumetric			
l.2	Mechanical			
m.	Maximum startup time of compressors	sec		
n.	Casing type			
o.	Rotor type.			
p.	Rotor construction.			
q.	Critical speed	rpm		
r.	Max. cont. speed	rpm		
s.	Hydrotest pressure	psig		
t.	Maximum casing temperature	°F		
u.	Materials:			
u.1	Casing			
u.2	Rotor			
u.3	Shaft			
v.	Motors			
v.1	Type			
v.2	Manufacturer			
v.3	Frame size			
v.4	Mounting			
v.5	Voltage/voltage variation			
v.6	Phase			
v.7	Sync speed	rpm		
v.8	Rated power	bhp		
v.9	Rated full load speed	rpm		
v.10	Service factor			

v.11	Rotation (from driving end)			
v.12	Ground terminals provided?	Y/N		
v.13	Type of duty			
v.14	Method of starting			
v.15	Maximum winding temp	°F		
v.16	Area Classification:			
v.16.1	Type of service			
v.16.2	Enclosure			
v.16.3	Type of cooling			
v.16.4	Insulation class			
v.17	Locked Rotor Current:			
v.17.1	At 80% voltage			
v.17.2	At 100% voltage			
v.17.3	At 110% voltage			
v.18	Motor Starting Current:			
v.18.1	At 80% voltage			
v.18.2	At 100% voltage			
v.18.3	At 110% voltage			
v.19	Motor Efficiency:			
v.19.1	At 100% load			
v.19.2	At 75% load			
v.19.3	At 50% load			
v.20	Power Factor			
v.20.1	At 100% load			
v.20.2	At 75% load			
v.20.3	At 50% load			
w.	PLC			
w.1	Model			
w.2	Communication protocal to DCS			
8.3	Air Dryer			
b.	Type			
c.	Model			
d.	Quantity			
e.	Capacity	scfm		
f.	Maximum capacity at given inlet conditions	scfm		
g.	Pounds of water removed per cycle	lb		
h.	Linear velocity through bed	fpm		
i.	Type and quantity of desiccant in each tower			
j.	Cross section area of desiccant bed	ft2		
k.	Pressure drop through dryer at maximum flow	psi		
l.	Design pressure	psig		
m.	Cooling Water Requirements (if applicable):			
m.1	Flow	gpm		
m.2	Temperature rise	°F		
n.	Pressure drop	psid		
o.	Overall Dimensions of Unit:			
o.1	Height	in		
o.2	Width	in		
o.3	Length	in		
p.	Prefilter:			
p.1	Manufacturer/Model			
p.2	Maximum capacity	scfm		

p.3	Smallest particle size 100% removed	microns		
p.4	Oil removal	ppm		
p.5	Pressure drop (clean)	psi		
p.6	Pressure drop (dirty)	psi		
q.	Afterfilter:			
q.1	Manufacturer/Model			
q.2	Maximum capacity	scfm		
q.3	Smallest particle size 100% removed	microns		
q.4	Oil removal	ppm		
q.1	Pressure drop (clean)	psi		
q.2	Pressure drop (dirty)	psi		
8.4	Air Receiver			
a.	Quantity			
b.	Volume	gal		
c.	Dimensions	ft		
d.	Material/Thickness			
e.	Coatings			
9.	**DUCTWORK**			
9.1	Material of Construction			
a.	Inlet Duct			
a.1	Plate Material			
a.2	Stiffener Material			
a.3	Minimum Plate Thickness			
a.4	Total Steel Tonnage	Tons		
a.5	Insulation & Lagging Material			
b.	Outlet Transition Elbow Duct			
b.1	Plate Material			
b.2	Stiffener Material			
b.3	Minimum Plate Thickness			
b.4	Total Steel Tonnage	Tons		
c.	Outlet Ductwork - elbow to chimney			
c.1	Plate Material			
c.2	Stiffener Material			
c.3	Minimum Plate Thickness			
c.4	Total Steel Tonnage	Tons		
d.	Design Pressures (positive and negative)			
d.1	Ductwork to absorber	in. w.c.		
d.2	Absorbers	in. w.c.		
d.3	Ductwork absorber to chimney	in. w.c.		
e.	Temperature for which ductwork stress levels are based at design temperature	°F		
e.1	Ductwork to absorber	in. w.c.		
e.2	Absorbers	in. w.c.		
e.3	Ductwork absorber to chimney	in. w.c.		
f.	Size			
f.1	Absorber inlet duct (width ft. x height ft. x length ft.)	ft x ft x ft		
f.2	Absorber outlet elbow duct (diameter ft. x length ft.)	ft x ft		
f.3	Absorber outlet duct - elbow to chimney (diameter ft. x length ft.)	ft x ft		

10.	**DUCTWORK - FLUE GAS FLOW IMPROVEMENT (IF REQUIRED)**			
10.1	Material of Construction - Turning Vanes:			
a.	Type			
b.	Thickness	in		
10.2	Total square feet of turning vanes furnished	ft^2		
10.3	Size:			
10.4	Number of vanes			
10.5	Temperature for which ductwork stress levels are based at design pressures	F		
11.	**EXPANSION JOINTS**			
11.1	Absorber Outlet Ductwork Expansion Joint			
a.	Fabric Material			
b.	Wire Material			
c.	Elastomer Material			
d.	Design temperature			
d.1	Operating	°F		
d.2	Excursion	°F		
e.	Design pressure			
e.1	Operating	in. w.c.		
e.2	Excursion	in. w.c.		
f.	Design life	cycles		
g.	Frame Material			
h.	Insulation type and thickness			
i.	Dimension (face to face)	inch		
11.2	Expansion Joint at Chimney Breeching			
a.	Fabric Material			
b.	Wire Material			
c.	Elastomer Material			
d.	Design temperature			
d.1	Operating	°F		
d.2	Excursion	°F		
e.	Design pressure			
e.1	Operating	in. w.c.		
e.2	Excursion	in. w.c.		
f.	Design life	cycles		
g.	Frame Material			
h.	Insulation type and thickness			
i.	Dimension (face to face)	inch		
11.3	Expansion Joint (Other)			
a.	Fabric Material			
b.	Wire Material			
c.	Elastomer Material			
d.	Design temperature			
d.1	Operating	°F		
d.2	Excursion	°F		
e.	Design pressure			
e.1	Operating	in. w.c.		

e.2	Excursion	in. w.c.		
f.	Design life	cycles		
g.	Frame Material			
h.	Insulation type and thickness			
i.	Dimension (face to face)	inch		
12.	**HYDROCLONES - PRIMARY DEWATERING**			
12.1	Number furnished			
12.2	Diameter	ft		
12.3	Number of spares			
12.4	Shell material			
12.5	Lining material			
12.6	Vortex finder material			
12.7	Lining thickness	in.		
12.8	Gypsum inlet slurry flow	lb/hr		
12.9	Gypsum slurry pH:			
a.	Normal			
b.	Maximum - minimum			
12.2	Slurry Solids Concentration:			
a.	Hydroclone Inlet	%		
b.	Outlet:			
b.1	Underflow	%		
b.2	Overflow	%		

13.	**POWER-OPERATED VALVES**			
13.1	Control Valves			
a.	Valve body style			
b.	Valve inlet/port size	in / in		
c.	Type of plug			
d.	Materials of Construction			
d.1	Valve body			
d.2	Plug			
d.3	Plug facing			
d.1	Seat ring and seat facing			
d.5	Lining			
e.	Solenoids: Voltage	V		
f.	Limit switches - number and type of contact			
13.2	Motor-Operated Valves:			
a.	Valve body style			
b.	Valve inlet/port size (in/in)	in / in		
c.	Type of plug			
d.	Valve body material			
e.	Plug material			
13.3	Valve Motor Operator Data			
a.	Type			
b.	Size			
c.	Suitable for mounting in any position	Y/N		
13.4	Position Switches			
a.	Voltage rating	V		
b.	Contact rating at 125 Vdc inductive	A		
13.5	Torque Switches			
a.	Voltage rating	V		
b.	Inductive current rating at 125 Vdc	A		
14.	**FLUSH WATER REQUIREMENTS**			
14.1	Limestone Slurry Loop (one loop)			
a.	Flow	gpm		
b.	Total Volume	gal		
14.2	Recycle Water System			
a.	Flow	gpm		
b.	Total Volume	gal		
14.3	Absorber Bleed System			
a.	Flow	gpm		
b.	Total Volume	gal		
14.4	Hydroclone Underflow System			
a.	Flow	gpm		
b.	Total Volume	gal		
15.	**LIMESTONE PREPARATION EQUIPMENT**			
15.1	Ball mill pulverizers:			
a.	Materials of construction			
b.	Number supplied			
c.	Required feed size			
d.	Product fineness			
e.	Total capacity (tph)	ton/hr		
15.2	Mill Product Tank			
a.	Dimensions (H x D)	ft x ft		

b.	Capacity			
c.	Materials of construction			
15.3	Limestone and Mill Feed Silo Dust Collectors			
a.	Service			
b.	Capacity	cfm		
c.	Air/cloth ratio:			
15.4	Limestone Silo			
a.	Dimensions (H x D)	ft x ft		
b.	Capacity (specify material density)	ft3		
c.	Material of construction			
d.	Cone angle			
e.	Cone height			
f.	Cone lining material			
g.	Outlet dimensions	ft x ft		
16.	**CRANES AND HOISTS**			
16.1	Cranes			
a.	Manufacturer			
16.2	Hoists			
a.	Manufacturer			
b.	Type			
c.	Capacity	tons		
d.	Lift	ft		
17.	**INSTRUMENTATION & CONTROLS**			
17.1	DCS I/O Requirements			
a.	Per Absorber			
a.1.	120 Vac digital inputs (Field Powered)	Qty		
a.2.	125 Vac digital inputs (Field Powered)	Qty		
a.3.	24 Vdc digital inputs (DCS Powered)	Qty		
a.4.	Isolated relay digital outputs	Qty		
a.5.	4-20 mA analog inputs	Qty		
a.6.	RTD analog inputs	Qty		
a.7.	Thermocouple analog inputs	Qty		
a.8.	4-20 mA analog outputs	Qty		
a.9.	Others (list items)	Qty		
b.	Common Gypsum Dewatering Building			
b.1.	120 Vac digital inputs	Qty		
b.2.	125 Vac digital inputs	Qty		
b.3.	24 Vdc digital inputs (DCS Powered)	Qty		
b.4.	Isolated relay digital outputs	Qty		
b.5.	4-20 mA analog inputs	Qty		
b.6.	RTD analog inputs	Qty		
b.7.	Thermocouple analog inputs	Qty		
b.8.	4-20 mA analog outputs	Qty		
b.9.	Others (list items)	Qty		
c.	Common reagent Preparation Building			
c.1.	120 Vac digital inputs	Qty		
c.2.	125 Vac digital inputs	Qty		
c.3.	24 Vdc digital inputs (DCS Powered)	Qty		
c.4.	Isolated relay digital outputs	Qty		
c.5.	4-20 mA analog inputs	Qty		
c.6.	RTD analog inputs	Qty		

c.7.	Thermocouple analog inputs	Qty		
c.8.	4-20 mA analog outputs	Qty		
c.9.	Others (list items)	Qty		
17.2	Instrument Data - Manufacturer and Model			
a.	Control Drives			
b.	Control Valves			
c.	Transmitters (pressure and differential pressure)			
d.	Pressure and Temperature Switches			
e.	Level Transmitters			
f.	Flow Transmitters			
g.	Local Gauges			
h.	Thermocouples and RTD's			
i.	Analyzers			
j.	Vibration Monitoring Systems			
18.	**CONCRETE WORK (ABOVE GROUND)**			
18.1	Absorber Building			
a.	Cubic yards of concrete	Cu. yrds.		
b.	Floor slab thickness	in		
c.	Total concrete for floor area	Sq. ft.		
18.2	Reagent Preparation Building			
a.	Cubic yards of concrete	Cu. yrds.		
b.	Floor slab thickness	in		
c.	Total concrete for floor area	Sq. ft.		
18.3	Dewatering Building			
a.	Cubic yards of concrete	Cu. yrds.		
b.	Floor slab thickness	in		
c.	Total concrete for floor area	Sq. ft.		
19.	**STRUCTURAL WORK**			
19.1	Structural Steel and Access Galleries			
a.	Absorber building			
a.1.	Structural steel, painted	Tons		
a.2.	Structural steel, galvanized	Tons		
a.3.	Grating, 1-1/4"	Sq. ft.		
a.4.	Grating, 1-1/2"	Sq. ft.		
b.	reagent preparation building			
b.1.	Structural steel, painted	Tons		
b.2.	Structural steel, galvanized	Tons		
b.3.	Grating, 1-1/4"	Sq. ft.		
b.4.	Grating, 1-1/2"	Sq. ft.		
c.	Gypsum dewatering building			
c.1.	Structural steel, painted	Tons		
c.2.	Structural steel, galvanized	Tons		
c.3.	Grating, 1-1/4"	Sq. ft.		
c.4.	Grating, 1-1/2"	Sq. ft.		
19.2	Metal siding			
a.	Absorber building	Sq. ft.		
b.	reagent preparation building	Sq. ft.		
c.	Gypsum dewatering building	Sq. ft.		
19.3	Roof metal decking and roofing			
a.	Absorber building	Sq. ft.		
b.	reagent preparation building	Sq. ft.		

c.	Gypsum dewatering building	Sq. ft.		
19.4	Linear footage of handrail with guardplate except at stairs			
19.5	Grout			
a.	Cubic feet of grout for all areas including but not limited to steel columns and posts, stair and ladder terminations, mechanical and electrical equipment, pipe supports, and cable tray supports for all areas.			
19.6	reagent preparation building design includes conveyor loads (YES/NO)			
19.7	Pipe support auxiliary steel in DISTRICT's utility racks	Tons		

Cell: B306
Comment: Dana Robert Jensen:
Will we be using 250VDC in the Scrubber? I'd suspect not.

DATA PAGES FOR
WFGD SYSTEMS

NAME OF CONTRACTOR: _____

		Included in Bidder's Proposal (Yes/No)	Bidder's Proposal Reference
20.	**INFORMATION REQUIRED IN BIDDER'S PROPOSAL**		
20.1	Schedule showing all phases of work to be done including procurement, fabrication, testing, delivery, etc.		
20.2	Completed Price Quotation Table (See Section C)		
20.3	Completed Proposal Data Pages (Parts 1 thu 20)		
20.4	List of Technical Exceptions and Clarifications		
20.5	List of Commercial Exceptions and Clarifications		
20.6	Project Schedule		
20.7	Proposal shall include a detailed payment schedule based on key design, engineering, fabrication milestone dates.		
20.8	List of subcontractors and major equipment sub-suppliers		
20.9	Complete Process Flow Diagrams		
20.10	Piping and Instrumentation Diagrams.		
20.11	FGD system water balance diagram including blowdown constituents and the concentrations of each constituent.		
20.12	Foundation settlement criteria		
20.13	Not-to-Exceed Electrical Load List providing power rating in horsepower or kilowatts and voltage level for each load. The list should also indicate which loads are concurrently running during normal operation.		
20.14	Equipment data sheets providing technical data and ratings for all medium voltage motors.		
20.15	Preliminary DCS I/O Count by Type and Location for Each Unit.		
20.16	DCS Topology Drawing		
20.17	Complete general arrangement drawings showing the relative location of all equipment, buildings, and enclosures, and principal dimensions of the systems and equipment.		
20.18	Drawings showing the location and size of all interface connections, including proposed terminations of DISTRICT's ductwork.		
20.19	Bidder shall clearly state in its proposal how nozzles, spray headers, cyclone classifiers, etc are accessed and maintained. Any scaffolding requirements shall be clearly delineated in Bidder's proposal.		
20.20	Bidder shall indicate if the Absorber Integral Oxidation Recycle Tank meets the sizing requirements of Section G, Section 441130 Article 201.2. If not, Bidder shall provide detailed information on a WFGD system designed by the Bidder with a lower solid and/or liquid residence time on the same operating conditions as those for GGS. Bidder shall provide the exact solids percentage of the recirculating slurry, though it is expected that the percentage be no less than 15-wt% and no greater than 20-wt%. Any exceptions to residence time and percent solids must be adequately demonstrated by operating facilities on conditions corresponding to those expected at GGS Units 1 and 2.		
20.21	Bidder shall indicate if an exception is taken to Section G, Section 441130 Article 201.1.d regarding the L/G ratio requirements. If yes, Bidder shall provide detailed information on a WFGD system designed by the Bidder with lower L/G ratios, and state the value of the alternative L/G and submit the total firm price adjustment to the base bid should the DISTRICT accept the alternative.		
20.22	Bidder shall confirm that the performance guarantees will be met with the limestone reactivity and alkalinity specified in the analysis included in Section G, Attachment 3.		

20.23	Bidder shall describe the required FGD system design and operating features needed in addition to the options below for Bidder's structural design pressure and temperature and FGD outlet cone rotation to accommodate future operation of the FGD system upstream of an add-on carbon capture facility Design Temperature: 40°F to 180°F Design Pressure: -55" wg to +25" wg Oultet cone rotation of +\- 90 deg or 180 deg		
20.24	Calculation or explanation of the basis for the sizing of the quench system		
20.25	Description of services provided including operator and maintenance training and startup services.		
20.26	A complete list of all equipment supplied, including manufacturer and quantity.		
20.27	Absorber Recycle pump performance curves which including capacity, total head, efficiency, brake horsepower, NPSH required, and pump manufacturer.		
20.28	Bidder's loading diagrams and not-to-exceed loads with bid for all equipment in the following areas (magnitude direction, and load case shall be specified for each load transferred to the DISTRICT's support structure)		
a	Absorbers: All anticipated Not To Exceed (NTE) loads for all associated absorber equipment		
b	Limestone Preparation: All anticipated NTE loads for all associated reagent preparation area equipment shall be provided.		
c	Gypsum Dewatering: All anticipated NTE loads for all associated gypsum dewatering area equipment shall be provided		
20.29	Full scale commercial plant experience will be required to demonstrate the capability of Contractor to meet his guarantee. This test data shall include the plant name and the following: Fuel type Absorber gas flow SO2 concentration in and out WFGD pressure drop Absorber gas velocity Reactant stoichiometric ratio Absorber liquid-to-gas ratio Absorber materials of construction		
20.30	Project Team Chart showing the key members of the Contractor's Project Team. Resumes of the personnel on the team chart shall also be submitted for evaluation. A table showing the commitment of each team member shall be submitted.		
20.31	Spare Parts List (Recommended for 1 Year)		
20.32	Detailed installation history of operating units to support selection of L/G and spray stages or levels		
20.33	Absorber insulation recommendation and specification		
20.34	Overview of removal, access and galleries, including grating material to be used (galvanized and/or FRP).		
20.35	QA/QC manual		
20.36	QA/QC services self-performed or contracted?		
20.37	Provide QA/QC staffing plan		
20.38	Industrial Health and Safety Program		
20.39	Provide records and trends for EMR, ORIR, LTIR, OSHA 300 logs		
20.40	Provide procedure documents for critical lifts, special PPE		
20.41	Describe on-site safety training		
20.42	Describe on-site safety personnel plan		
20.43	Description of the plans to provide appropriate craft labor, equipment and management resources		
20.44	% self-performed, types of subcontracted work		
20.45	Describe previous experience with proposed subcontractors		
20.46	Provide subcontractor's safety records		

20.47	Information on the project workload paralleling the time frame of the project		
20.48	Field mobilization plan		
20.49	Laydown requirements (space and location) & construction facilities		
20.50	Construction equipment locations (i.e., cranes) & transport paths		
20.51	Temporary power requirements (quantity and location)		
20.52	Monthly field manpower forecast for craft (by craft) and non-manuals		
20.53	Describe craft work schedule / shift work plan		
20.54	Provide material control & storage maintenance plan		
20.55	Describe construction turnover packages & schedule for turnover		
20.56	Describe site maintenance services not provided		
20.57	Describe field procurement plan		
20.58	Describe project controls plan		
20.59	Describe compatibility of project management controls software		
20.60	Describe plan for administering change orders & extra work		
20.61	Describe coordinatin of equipment vendor representatives		
20.62	Provide & describe progress monitoring tools used		
20.63	Provide constructability review process, approach, & staffing plan		